

MASS. EA20.2: M 31 /2

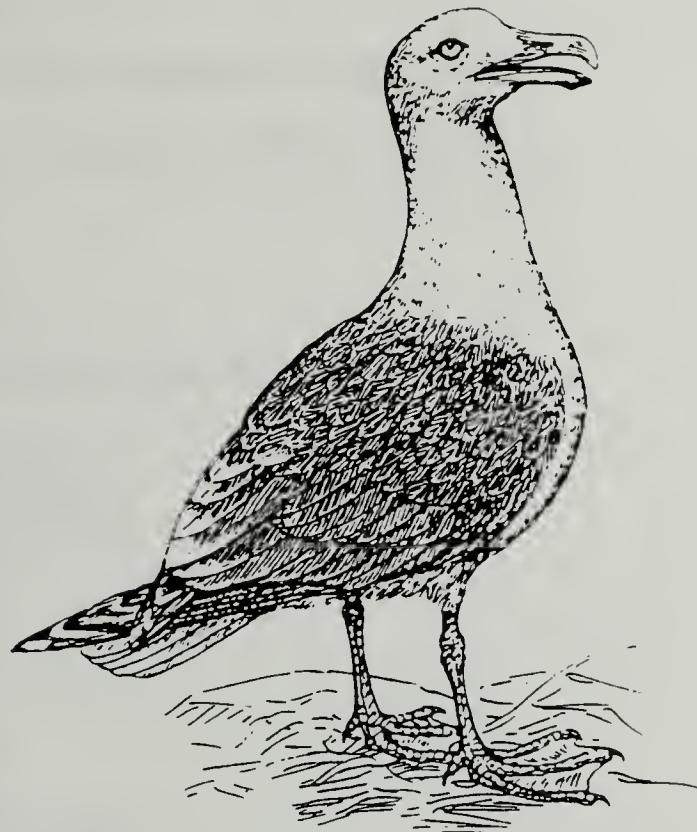


312066 0270 3504 8

MANUAL FOR GULL CONTROL

AT

MASSACHUSETTS LANDFILLS



JOINTLY DEVELOPED BY:

**Metropolitan District Commission,
Division of Watershed Management**
**Massachusetts Department of Environmental Protection,
Bureau of Waste Prevention**
Massachusetts Division of Fisheries & Wildlife
USDA APHIS Wildlife Services

May 1998

MANUAL FOR GULL CONTROL AT MASSACHUSETTS LANDFILLS

TABLE OF CONTENTS

I. INTRODUCTION	1
II. BACKGROUND	2
A. GULL SPECIES OF CONCERN	2
B. GULLS AND WATER SUPPLIES	2
C. GULLS AND LANDFILLS	3
III. OVERVIEW OF GULL CONTROL METHODS	4
IV. GULL CONTROL PROGRAM FOR LANDFILLS	5
A. GENERAL	5
B. PROGRAM COMPONENTS	5
1. <i>Habitat Alteration</i>	5
a) <u>Minimize Surface Area of Active Face</u>	5
b) <u>Daily Coverage</u>	6
c) <u>Vegetation Management</u>	6
d) <u>Surface Water Elimination</u>	6
e) <u>Physical Barriers</u>	7
2. <i>Harassment Methods</i>	7
a) <u>Human Presence</u>	7
b) <u>Pyrotechnics</u>	7
c) <u>Gull Distress Calls</u>	8
d) <u>Propane Cannons</u>	8
e) <u>Visual Frightening Devices</u>	8
f) <u>Trained Dogs</u>	8
3. <i>Lethal Methods</i>	8
a) <u>Shooting</u>	8
b) <u>Toxicants</u>	8
C. PROGRAM MONITORING AND MODIFICATION	9
V. SUMMARY	9
RESOURCE LIST	11
FIELD DATA FORM - GULL CONTROL PROGRAM	14



MANUAL FOR GULL CONTROL AT MASSACHUSETTS LANDFILLS

I. INTRODUCTION

In recent years, large numbers of gulls leave coastal zones and use inland portions of Massachusetts during fall and winter months. The combination of large inland water bodies for night roosting, plus abundant and concentrated food supplies at local landfills, have created very favorable conditions for the survival of these species.

The resulting high concentrations of gulls at inland sites have resulted in a number of public health, safety or nuisance problems. These include risks of bird strikes around airports, contamination of public water supplies and possible disease transmission. A wide variety of methods have been used in an attempt to control the impacts of gulls, and some efforts have successfully reduced localized problems. For example, gull harassment programs at several area landfills have reduced the threat of bird strikes at Westover Airbase in Chicopee; daily harassment efforts at Quabbin and Wachusett reservoirs have substantially reduced water quality problems associated with night roosting gulls.

However, the long-term solution to gull problems will require a coordinated effort on the part of various governmental agencies and private parties to control not only roosting behavior, but also gull access to major food supplies at landfills and other locations. Otherwise, individual gull control efforts will only have the effect of moving the gulls, and the problems, to other locations.

This manual discusses the problems associated with fall and winter concentrations of gulls in Massachusetts, and outlines a program and methods to control gull feeding at municipal solid waste landfills. Much of the information used in this manual came from the scientific literature, the experiences and observations of staff from the Metropolitan District Commission/Division of Watershed Management (MDC/DWM), the Massachusetts Division of Fisheries & Wildlife (MDFW), and the USDA/APHIS/Wildlife Services office in Amherst. Additional information was taken from a Fugro-McClelland report prepared for Resource Control, Inc. (Fugro-McClelland (East). 1993 (draft). "An Appraisal of Potential Gull Problems Associated with a Proposed Landfill in Clinton, Massachusetts And Practical Solutions"). Paul Lyons (MDC) was the primary author of this manual. In addition, Paul Emond (DEP), Brad Blodget (MDFW), Laura Henze (USDA APHIS), John Scannell (MDC), Pat Austin (MDC) and Dan Clark (MDC) played significant roles in its development.

II. BACKGROUND

A. Gull Species of Concern

Two species of gulls are typically associated with landfills and water supply reservoirs in this region: Herring Gulls (*Larus argentatus*) and Great Black-backed Gulls (*Larus marinus*). Ring-billed Gulls (*Larus delawarensis*) also use landfills, but not to the extent that the other two species do. The herring gull is the common gull of the Northeast - a large bird with a white head and underparts, and gray wings with black tips when in adult plumage. Herring gull young of the year have a generally brown appearance, acquiring progressively more white plumage with each successive molt as they mature.

Herring gulls breed in the northern latitudes of both the New and Old Worlds. In New England, breeding colonies are found from Maine to Connecticut. Herring gulls nest almost exclusively on coastal islands. The only known inland colony of herring gulls in Massachusetts was located on an island in the Wachusett Reservoir in central Massachusetts. The herring gull is migratory and nests from April through September. The main food items of herring gulls have been reported as garbage, sewage, fishery wastes and various mussels and crabs.

Great black-backed gulls have a similar natural history to herring gulls, and are also similar in appearance, except for their larger size and the characteristic black back in adults. Relatively uncommon in Massachusetts until the 1960's, the black-back population has increased dramatically in the past few decades. Although they tend to be less associated with human activities than herring gulls, black-backs are still commonly observed at landfills and readily intermix with herring gulls.

Ring-billed gulls look similar to herring gulls, but are smaller with yellowish rather than pinkish feet and a black stripe around the bill. These gulls are found more extensively in the interior United States than in New England. Although they are sometimes observed at landfills, ring-billed gulls are more frequently found at shopping malls, near fast-food restaurants, or feeding on worms and insects in open fields or agricultural areas.

Gulls have caused or exacerbated a number of different ecological problems, which seem to stem primarily from the tremendous recovery and expansion of the gull population in this century. This has been a world-wide phenomenon, which began in the late 19th century after the gull populations had been decimated by those who took the eggs and chicks for consumption, and killed adults for their plumage. Bird protection laws were passed, and between 1900 and 1960, herring gulls expanded from a few birds nesting in Maine to thousands nesting as far south as North Carolina. At the present time, herring gull and ring-billed gull populations appear to have stabilized, or are declining, but great black-backed gull populations continue to increase and expand their range.

B. Gulls and Water Supplies

Gull roosting and loafing on water supply reservoirs can lead to contamination of those water supplies, and such problems have been experienced by water supply managers in various parts of the state. These impacts can be particularly problematic at smaller reservoirs that do not have the dilution potential to deal with the contamination associated with hundreds or thousands of roosting gulls, which often use these smaller reservoirs as loafing areas during daylight hours. Larger reservoirs in Massachusetts (e.g., Quabbin and Wachusett) are also affected however, since these water bodies (along with the Connecticut River) appear to be the primary night roost locations for gulls in the state.

With new federal and state drinking water regulations currently in effect, increased concern and attention have been focused on gull impacts and control in recent years. These efforts have mainly involved gull harassment, with the goal of eliminating gulls altogether from smaller water bodies, or moving the roosting birds far enough away from water intakes to allow natural settling and dilution of the contaminants on larger reservoirs. On Quabbin and Wachusett reservoirs, intensive gull control efforts have been underway for several years, and have produced very positive results.

The most common problem associated with gull roosting on water supply reservoirs has been contamination with fecal bacteria. However, another concern is the transmission of human pathogens such as *Salmonella*, which gulls have been known to carry. Further, gulls may also serve as mechanical vectors of disease organisms that are picked up on their feet and/or feathers at landfills or sewage treatment plants. Even in the absence of such disease transmission however, fecal coliform contamination alone can render reservoir water legally unfit to drink and mandate costly water treatment measures.

The greatest use of inland reservoirs by gulls generally occurs in fall and winter with populations increasing steadily from the end of the breeding season through ice-up. However, midwinter use is highly variable; inclement weather generally increases gull use of inland reservoirs, and ice-up restricts their use. In Massachusetts, the Quabbin and Wachusett reservoirs, along with the Connecticut River, represent the largest inland fresh water sources, and all three are used by roosting gulls.

Diurnal activity patterns of gulls using night roost reservoirs are regular and predictable. Most birds leave the reservoirs shortly after dawn and disperse widely in search of food. Landfills, shopping centers, fish processing plants, and sewage outfalls are primary feeding areas. Although not well-documented, it is likely that gulls will travel up to 50 miles from roosting sites to some food sources.

During the day, gulls use various sites as "loafing areas" when they are not feeding. These areas often include roofs of buildings, watertowers, open fields, ponds, lakes and reservoirs, usually in close proximity to feeding areas. For water supply managers with reservoirs close to landfills, this behavior can be of particular concern, since the gulls generally spend most of the day at the reservoir - loafing, washing and defecating - leaving only occasionally and for relatively short periods of time to feed at the landfill.

In general, few gulls remain on roosting reservoirs during the day, unless landfills are operating in close proximity. When flying to and from the reservoirs, the gulls use established flight paths, which generally correspond to the most direct routes to local landfills. Upon returning to the reservoirs, small groups often land in staging areas and then coalesce into a single larger flock in the main roosting area at dusk. The roosting areas are in the same general location of the reservoir on most nights.

C. Gulls and Landfills

Gulls are attracted to landfills and other refuse disposal sites due to the abundance of edible waste they supply. In fact, many authors attribute the dramatic worldwide increase in gulls - and in particular herring gulls, great black-backed gulls, and ring-billed gulls in North America - to the abundant year round supply of high quality food which became available at landfills during the past century.

Once they arrive at a landfill (usually close to daybreak), gulls may land nearby, or continue to soar above the site as high as 3000 feet. This behavior creates additional concerns when airfields are located nearby. Accordingly, many commercial and military airports conduct active gull harassment or control to minimize risks of bird strikes with their planes.

Although they usually spend most of the daylight hours in the vicinity of landfills or other feeding areas, gulls may spend relatively little time actually feeding. When pressed, gulls can consume their whole daily food intake in only 15 minutes. This is a very important factor to consider when planning gull control activities - i.e., there can be no lapses in the harassment program that would allow the gulls to feed even for a short time.

The number of gulls utilizing a given landfill depends on a number of factors including the weather, season, landfill size, location and management (including gull harassment) practices, and type of refuse present. Gull use is generally highest from September to March, during the period not devoted to nesting. However, within these general trends, daily gull use is still highly variable.

III. OVERVIEW OF GULL CONTROL METHODS

Gull control methods can be categorized into one of two groups: 1) direct or active methods, which either decrease the population through the destruction of eggs or killing of birds, or which actively disperse birds from an area; and 2) indirect or passive methods which alter habitat to make it less attractive to the birds.

Population reduction methods are usually impractical at landfills or roosting sites, due to the inherent difficulty in killing enough birds to substantially reduce their numbers. This method has been used successfully at nesting sites however, where the gulls' strong attachment to the nest helps overcome their otherwise wary nature.

Numerous methods have been developed to harass or disperse gulls from areas where they are not wanted. These include human presence, pyrotechnics, recorded distress calls, propane cannons, visual frightening devices, and trained dogs. In general, methods utilizing human presence tend to be more effective but also more expensive.

Mechanical or stationary devices may work initially, but they generally lose effectiveness as the birds become accustomed to their presence and/or operation. The use of trained dogs has been very effective in reducing Canada goose numbers at golf courses and other problem areas, and may hold some promise for some landfill operations.

Indirect/passive methods (habitat management) are aimed at eliminating or making unavailable one or more of the five basic gull survival requirements: nesting areas, secure night-time roosting areas, feeding areas, loafing areas, and drinking water sources.

Nesting areas and night-time roosts are seldom if ever present at landfills. Access to feeding areas may be controlled by minimizing the area of the active cell surface area, covering the landfill food source, and denying access to the working face by overhead lines or other methods. Night time dumping is another option, since gulls do not feed at night. Loafing areas may be eliminated by removing surface waters at landfills. Seeding, planting or letting all grassy areas grow may also help since gulls avoid tall grass or shrubby areas that prevent them from seeing their surroundings.

Gulls are wary and adaptable animals, and an effective control program generally needs to be both varied and unpredictable. Thus, a combination of options is often used, along with a degree of irregularity in when, where and how they're applied.

IV. GULL CONTROL PROGRAM FOR LANDFILLS

A. General

This section provides a blueprint for implementing an effective gull control program at landfills. However, inherent in this proposal is the recognition that gull problems are regional concerns, not local ones, and that gull control operations at an individual landfill must be part of a larger regional effort to be truly successful. Thus, a concerted and coordinated effort by various state, federal and private agencies and parties is needed.

The goal of this coordinated effort should be to disrupt the daily patterns of gull feeding and roosting so as to bring about a major change in their behavior patterns in the region. On an individual landfill level, this will require that gulls are completely prevented from feeding at that site. It's crucial to understand that nothing but 100% effectiveness is acceptable. If gulls are precluded from feeding for most of the day, except during a brief period during the machine operator's lunch break or for 20 minutes after the landfill closes, then the whole effort was for naught. Remember, when pressured, gulls can meet their total daily food intake requirements in less than 15 minutes, even though they may spend the whole day at or near the landfill.

It's also important to understand that intensive gull control may only be necessary for a short time period, just until the birds get the message that they cannot feed at that site. Experiences at other landfills suggest that this learning occurs in as little as two days. Thus, although continued vigilance and control measures are still periodically needed afterwards, the intensive gull control period may be very short. Again, this all hinges on the initial effort being close to 100% effective.

B. Program Components

Effective gull control programs usually employ a variety of methods to prevent acclimation by the birds. Thus, the following techniques should be viewed as a "pool" of potential options for dealing with gulls. At any one time, only one or a couple of the harassment methods might be needed, although the others should be readily available if and when needed.

In general, a landfill gull control program should include: 1) habitat alterations (indirect methods) to make the area less desirable to gulls; 2) a variety of harassment and lethal control methods (direct methods) designed to make it unsafe or undesirable for gulls to feed at the site; and 3) accurate monitoring and record-keeping of control measures used and gull responses. Each of these components will be discussed further in the following sections. Local animal damage control professionals (see resource list at the end of this manual) can assist landfill operators in selecting the methods that best fit the specific characteristics of a site. In addition, proper permits should be obtained so that the landfill operators can legally implement the full range of gull control options.

1. *Habitat Alteration*

As described earlier, habitat alteration involves eliminating or restricting access to any of the basic survival requirements of gulls. At landfills, this can often be accomplished by minimizing the surface area of the active landfill face, providing good daily coverage of refuse, managing nearby vegetation, eliminating local surface water sources. In some cases, it may be necessary to restrict access to refuse with overhead wires or other physical barriers.

- a) **Minimize Surface Area of Active Face** - The landfill should be designed and operated so as to minimize the surface area where refuse is deposited. This will decrease the site's attractiveness to gulls, and facilitate the spatial concentration of active gull

control efforts, making them easier to perform and more cost-effective.

b) **Daily Coverage** - Conventionally, landfill coverage is accomplished with soil materials. State regulations mandate complete coverage of the refuse at least once per day (at the end of the day), and when soil materials are used, the coverage must be at least six inches deep. Regular coverage of refuse throughout the day is desirable since it minimizes the availability of food for the gulls. In most cases, good coverage of refuse is the only means of preventing gull feeding during times when the landfill is closed. In practice however, complete coverage of refuse is difficult to achieve, although it should still be a goal of landfill operations. In situations where it is determined that conventional coverage methods are not preventing gulls from gaining access to refuse after hours, alternative coverage methods (e.g., tightly-woven plastic mesh) that can be pulled or rolled out over the active cell should be considered.

c) **Vegetation Management** - Gulls prefer, and are attracted to large open areas that are either devoid of vegetation (e.g., paved areas, gravel areas, exposed soil areas, open water areas), or have closely mown vegetation (lawns, agricultural fields). These areas provide ideal gull loafing habitat, and any that exist on the site should be eliminated or minimized. Grassy areas should not be mowed. All areas of exposed soil (except active cells, roads, and other necessary openings) on the landfill property which are presently devoid of vegetation (less than 25 percent plant cover) should be hydro-seeded or cultivated with an appropriate mixture of seed, fertilizer and mulch. The particular species of plant is not important, however, it should be a fast-growing species which grows rank (dense) and tall (>10 in.), grows on sterile soils with little cultivation, and has stout stems that resist lodging (laying down under rain, snow, wind). Cinquefoil (*Potentilla* spp.) has been suggested in the literature as suitable, however, quackgrass (*Agropyron repens*), reed canary grass (*Phalaris arundinacea*), or other species recommended by the Natural Resource Conservation Service for this purpose and in these soils can be used. The resultant vegetation should be allowed to grow, and be maintained at a height of at least ten inches where possible. The goal is to have the site's vegetation tall and dense. One cutting per year will usually be adequate to prevent the growth of woody vegetation. This cutting should be done in late April or early May (i.e., prior to grassland bird nesting seasons) so that the vegetation is rank and at least ten inches tall for the fall and winter months.

As the landfill operations progress, all areas that are recently filled and covered, and expected to remain inactive for a least one month, should be planted and treated as described above. Efforts should be made to maintain as much of the landfill property as possible with vegetation at least ten inches tall and preferably twenty or more inches.

d) **Surface Water Elimination** - Every attempt should be made to avoid, minimize and/or eliminate non-jurisdictional and non-required surface waters on the landfill site, including ponds, borrow pits and puddle areas. Most such surface waters are attractive to gulls as drinking and loafing sites. Grading activities conducted during landfill operations should be done in a manner to avoid the creation of surface water bodies.

e) **Physical Barriers** - Several means of physically excluding gulls from refuse areas have been used, including wire grids and metal buildings constructed over the dumping area. These tend to be expensive and/or labor intensive however. Wire grids, consisting of a single series of parallel lines, but more commonly two series of parallel lines erected at right angles to each other to form a mesh or grid pattern, can be erected above the active cell of the landfill. This method has been effectively used to exclude larger gull species from landfills, reservoirs and fish hatcheries. Grid spacing of 20 feet or less is generally effective on the three problem gull species found in this region. Either monofilament plastic line, or stainless steel wires can be used.

2. Harassment Methods

The above habitat modification methods can substantially reduce the attractiveness of a landfill to gulls. However, since the primary value of most landfills to gulls is as a food supply, it is likely that some gulls will still be present, even after habitat modification methods have been employed. The combination of habitat modification with active and diligent harassment of gulls can effectively eliminate gulls from landfills however. Following are some of the more effective harassment methods.

a) **Human Presence** - Although various artificial or mechanical methods have been developed to influence gull behavior, the tendency for gulls to acclimate to them precludes their use as the main means of landfill gull control. Thus, human presence, at least on a periodic basis, is very important in this program. Once a control program is underway, human presence alone is often enough to move gulls from an area. When combined with other methods, such as pyrotechnics, human presence is even more effective. The goal of this phase of the program is for the gulls to associate the sight of landfill staff with danger. To achieve this, it's important to make each encounter with landfill staff unpleasant, or better yet dangerous, for the gulls. This can be accomplished with the use of pyrotechnics, firearms, or other methods described below.

b) **Pyrotechnics** - A mainstay of most gull harassment programs is some form of pyrotechnic use. Shellcrackers, "screamers" and "bangers" are most commonly used. These devices are essentially fire-crackers that are projected into the middle of a flock of gulls. Shell crackers are fired from 12 gauge shotguns, which for safety purposes should be single-barreled, breech-loading guns with an open choke (modified or improved cylinder). Screamers and bangers are smaller diameter projectiles which are fired from commercially available .22 caliber starter or blank pistols. It has been found that screamers are particularly effective on gulls. Judicious and varied use of several different kinds of pyrotechnics is important, to prevent acclimation by the gulls. A list of suppliers of pyrotechnic devices appears at the end of this document. [Note that the use of certain pyrotechnic devices in Massachusetts requires the possession of a Firearms Identification (FID) Card or a License to Carry Firearms.]

In most situations, the combination of human presence and pyrotechnics will be enough to prevent gulls from landing and feeding. These two methods should form the foundation of the gull harassment program. However, various other methods are also available to supplement these methods.

- c) **Gull Distress Calls** - Cassette tapes of recorded gull distress calls are sometimes used to elicit a sense of alarm or a flight response in gulls. The effectiveness of distress or alarm calls can be further enhanced by displaying a dead or decoy gull in a dying or distressed posture while playing the tape. Reactions to distress calls tend to be species-specific (i.e., to elicit the desired response in herring gulls, you need to use herring gull distress calls, etc.), and sometimes result in curiosity instead of flight responses in the target birds. In the latter case, shellcrackers or screamers can be used to achieve the desired effect.
- d) **Propane Cannons** - These devices, which produce loud explosions at regular, pre-set intervals are often used in bird control, although their regularity often leads to acclimation, and thus reduced effectiveness. Again, they can be useful in combination with other methods.
- e) **Visual Frightening Devices** - These objects, including balloons with painted "eyes", flags and human or raptor effigies, are meant to provide gull control during times of no human presence. They may be effective in some situations, but seldom when used alone.
- f) **Trained Dogs** - While no information was found in the literature on the use of trained dogs to deter gull use of landfills, the technique still holds promise. Dogs have been used on occasion to scare problem birds from agricultural areas and airfields, and are currently used at a number of golf courses and corporate headquarters for controlling Canada geese. While still unproven as a control method for gulls at landfills, this method could prove to be very effective and inexpensive, and is worth pursuing if opportunities present themselves.

3. Lethal Methods

It is occasionally necessary to reinforce harassment with the actual killing or poisoning of one or more birds. Such activities do require a federal depredation permit, co-signed by the state Division of Fisheries & Wildlife. Depredation permits are issued by the U.S. Fish & Wildlife Service (USFWS); applications are available from the USDA Wildlife Services office (413 253-2403) or the USFWS Hadley office (413 253-8643).

Permit applications should be submitted well in advance of the anticipated start date of the gull control program. Two to three months lead time should be adequate.

- a) **Shooting** - While pyrotechnics are often effective in dispersing gulls, the birds sometimes acclimate to their use if no harm ever befalls them. Thus, it is sometimes necessary to supplement or reinforce pyrotechnic use with live shells that kill one or more gulls. For maximum effect and impact, shooting should be done when and where other gulls can witness the action. Considerable care should obviously be taken to avoid shooting of non-target species, and in residential areas. To avoid such problems, lethal methods should only be considered or used when other methods are becoming ineffective.
- b) **Toxicants** - Aversive conditioning of gulls has sometimes been achieved with the use of chemical frightening agents such as Avitrol. In Massachusetts, this is the only toxicant registered by both the USEPA and the Massachusetts Pesticide Bureau for use at landfills. When applied correctly, only a small percentage of the target population is

affected (usually less than 1%), but the rest of the birds are frightened away from the site. The chemical is completely metabolized in the birds that ingest it, thus there is no risk of secondary poisoning of nontarget species. Where gull activity is heavy, Avitrol may have to be re-applied several times a year to maintain adequate control. As with other bird control methods, Avitrol is most effective when used as part of an integrated program with other bird control methods. Avitrol is a restricted-use pesticide and may only be applied by licensed applicators. Both state and federal wildlife control permits are required. Further, since some members of the public may be opposed to the use of toxicants, discretion should be used with this product.

C. Program Monitoring and Modification

A monitoring program is essential for documenting the effectiveness of the gull control program, as well as for determining if and when modifications in the program are needed. Further, some record-keeping is required as a condition of the issuance of depredation permits. At a minimum, daily records should be kept on gull numbers, harassment activities (methods used, number of shots fired, etc.), responses of gulls to control activities, and number of gulls shot. Field data forms (an example of one is attached) should be used for recording this information, and completed forms should be collected and filed on a daily basis. Such records represent very important information that allows for continuous evaluation of the effectiveness of various control methods, as well as the overall success of the gull control program.

V. SUMMARY

Inland concentration of herring, great black-backed and ring-billed gulls in Massachusetts constitutes a serious threat to drinking water supplies, air traffic safety, and public health and welfare in general. Effective control of gulls requires a concerted effort on the part of state and federal agencies, water supply managers and landfill owners and operators.

Control of gulls at landfills should involve a combination of habitat modification and active harassment, with the goal of achieving 100% effectiveness in preventing gull feeding and loafing on site. Specific gull control programs should be developed for each landfill operation, and be geared specifically to the particular situation and layout of that landfill. Assistance in developing these plans is readily available through several state and/or federal agencies. All landfill staff should be familiar with the goals and methods of the plan, which should include both habitat modification and active harassment techniques.

Habitat modification options include minimizing the surface area of the active landfill face, complete daily coverage of refuse, managing vegetation to create an inhospitable environment for gulls, eliminating water sources, and using physical barriers such as overhead wires to restrict gull access to food supplies. Harassment methods include human presence, use of pyrotechnics, gull distress call tapes, propane cannons, visual frightening devices and trained dogs. Lethal measures such as shooting or toxicants may occasionally be needed to reinforce harassment methods.

Habitat modification works in conjunction with harassment techniques, and is intended to make the general area less attractive to gulls. Eliminating large open areas with no or low vegetation, along with good coverage of refuse and eliminating on-site water sources should accomplish this.

Gulls are very adaptable, and can acclimate quickly to any harassment method that poses no obvious threat of physical harm to them. Thus, it's important that gull control programs use a variety of methods and have the ability to switch quickly among them. In general, a diligent human presence, combined with the use of several pyrotechnic options and an occasional reinforcement with lethal methods (such as shooting) should be very effective. The use of trained dogs also holds potential.

In many cases, dramatic changes in gull behavior patterns can be brought about in only a few days if the harassment effort is diligent. In such cases, the gulls often leave the area altogether, at least temporarily, thus greatly reducing the amount of effort needed on subsequent days. However, as long as putrescible waste is available at the landfill, gulls will periodically visit the site and attempt to feed; thus, constant vigilance is required indefinitely to assure long-term success.

It is important that the gull control program remain adaptable and responsive to changes in gull populations, landfill operations, and concerns of the public and public agencies. This requires good record-keeping and communication. A close working relationship and open dialogue should be maintained with DEP, USDA APHIS Wildlife Services program and the MDFW. Private consultants are also available to train personnel, implement control programs, and/or conduct monitoring. MDC Division of Watershed Management staff are also available to share their knowledge and experiences with landfill gull control. These agencies, companies and individuals represent a wealth of information and experience on gull control methods and programs, and are ready and willing to consult with landfill operators on the development of effective programs.

RESOURCE LIST

I. TECHNICAL ASSISTANCE

Assistance with setting up and conducting gull control programs is available through several sources. For assistance with:

...control techniques, sources of supplies, permit applications, contact:

USDA APHIS Wildlife Services office 463 West Street Amherst, MA 01002 (413) 253-2403 (contacts: Laura Henze; Jennifer Lynch; Don Wilda)
--

...gull behavior, control program design, contact:

Brad Blodget, State Ornithologist Massachusetts Division of Fisheries & Wildlife One Rabbit Hill Rd. Westboro, MA 01081 (508) 792-7270
--

In addition, staff from the Metropolitan District Commission, Division of Watershed Management have been conducting gull control operations at MDC reservoirs and local landfills for several years. The following people can provide information and suggestions based on those experiences:

Dan Clark Wildlife Biologist (508) 792-7423 ext. 215	John Scannell Environmental Engineer (508) 365-5292	Paul Lyons Wildlife Biologist (413) 323-8998
---	--	--

II. EQUIPMENT SUPPLIERS

A. Pyrotechnic devices:

The Bullseye Gunshop
1081 Huntindon Ave.
Waterbury, CT 06704
(203) 755-1055

Colonial Fireworks
5956 Ivanhoe
Ipsilanti, MI 48197
(313) 482-3272

Pyrotechnic devices (cont.)

Margo Supplies Ltd.
Site 20, Box 11, RR #6
Calgary, Alberta, Canada
T2M 4L5
(403) 285-9731

O.C. Ag. Supply
1328 Allec St.
Anaheim, CA 92805
(714) 991-0960

Stoneco Inc.
P.O. Box 187
Dacono, CO 80514
(303) 833-2376

Wald & Co.
208 Broadway
Kansas City, MO 64105
(816) 842-9299
[rope firecrackers]

JPF Distributors
9 Union Square - Suite 184
Southbury, CT 06488
1-800-582-8843

New Jersey Fireworks Co.
Box 118
Vineland NJ 08360
(609) 692-8030
[rope firecrackers]

Reed-Joseph Internat'l Co.
P.O. Box 894
Greenville, MS 38702
(800) 647-5554
[carry bombs, screamers, bangers]

Sutton Ag Ent.
1081 Harkins Rd.
Salinas CA 93901
(408) 422-9693
[shellcrackers, whistlers]

Western Fireworks Co.
2542 SE 13th Ave.
Canby, OR 97013
(503) 266-7770

TAPCO Inc.
P.O. Box 818
Smyrna, GA 30081
(800) 359-6195
[12-gauge bombs, mini-grenades]

B. Visual Bird Repellents:

The Huge Co.
7625 Page Blvd.
St. Louis, MO 63133
(800) 325-3371

Pete Konzak
Box 20
Minnewaukan, ND 58351
(701)473-5646
[jump-up scarecrow]

Kite City
1201 Front St.
Old Sacramento, CA 95814
[hawk kite]

Mellingers
2310 W. South Range Rd.
N. Lima, OH 44452
(800) 321-7444
[scarecrow]

Visual Bird Repellents (con't)

Orchard Equipt. & Supply
P.O. Box 540
Conway, MA 01341
(413) 369-4335
[balloons, flash tape]

Sutton Ag. Ent.
746 Vertin Ave.
Salinas, CA 93901
(408) 422-9693
[kites]

Tri Lite Inc.
1335 West Randolph
Chicago, IL 60610
(312) 226-7778
[flashing lights]

Wildlife Mngmnt. Supplies
640 Starkweather
Plymouth, MI 48170
(800) 451-6544
[balloons]

C. Electronic or Recorded Sound Repellents:

Weitech, Inc.
P.O. Box 1659
310 Barclay Way
Sisters, OR 97759
(800) 343-2659

Bird Busters
1083 Thomas Jefferson St., N.W.
Washington, D.C. 20007
(800) NO-BIRDS

Johny Stewart
Box 7594
Waco, TX 76710
(800) 537-0652

Sutton Ag. Enterprises, Inc.
746 Vertin Ave.
Salinas, CA 93901
(408) 422-9693

Reed-Joseph Internat'l
232 Main Street
P.O. Box 894
Greenville, MS 38702
(800) 647-5554

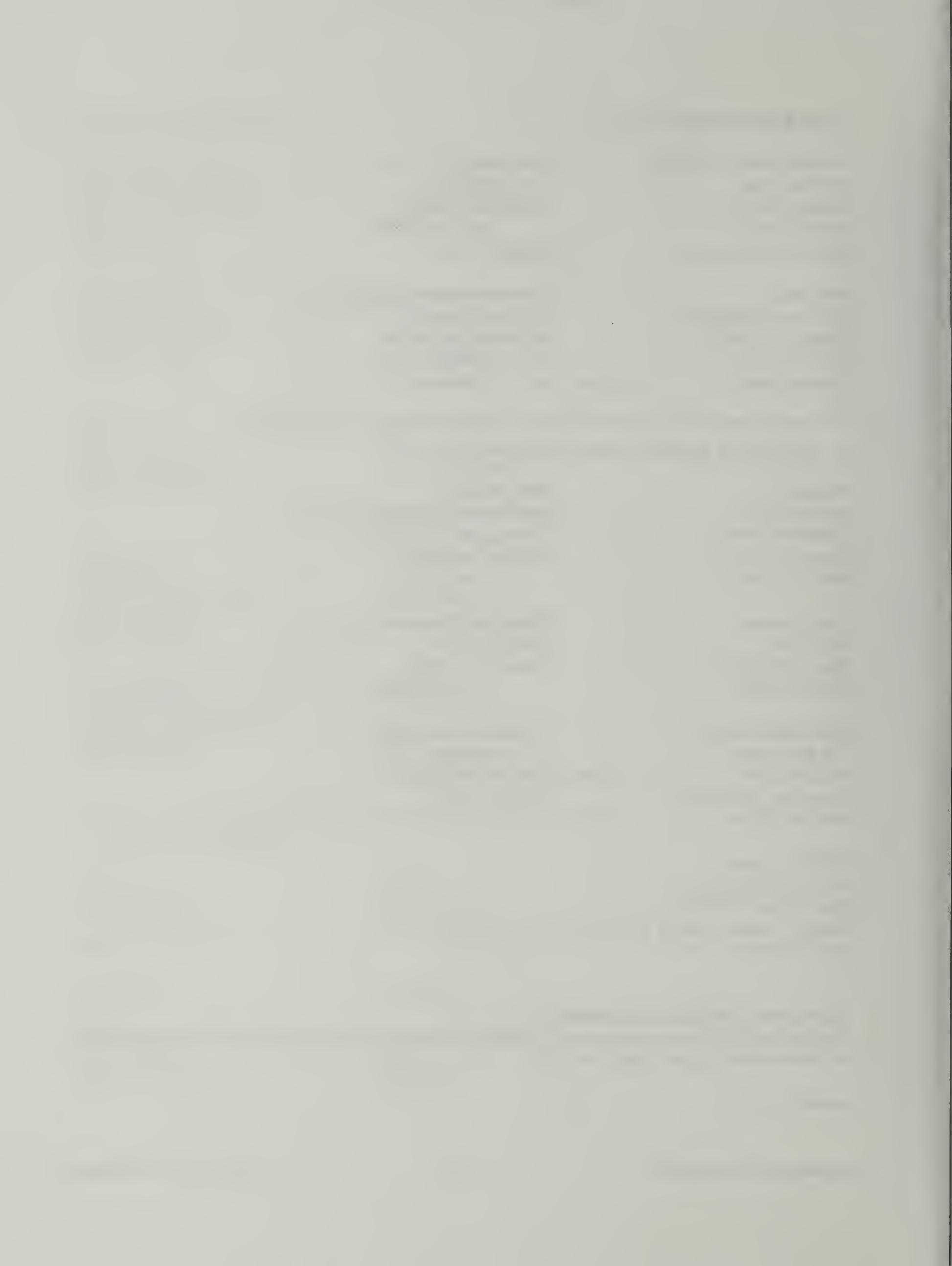
Signal Education Aids
2314 Broadway
Denver, CO 80205
(303) 295-0479

Wildlife Control
Margo Supplies Ltd.
Site 20, Box 11 RR #6
Calgary, Alberta, Canada T2M 4L5
(403) 285-9731

III. SAMPLE FIELD DATA FORM

The form on the following page can be used to record daily gull observations, and to document the use and effectiveness of gull control activities.

gulmafnl.598



FIELD DATA FORM - GULL CONTROL PROGRAM

F.

DATE :

DA

CONDITIONS:

SKY:

TEMPERATURE :

WIND:

PRECIPITATION:

GULL OBSERVATIONS AND CONTROL ACTIVITIES:

COMMENTS :

